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Silicon-based field-effect transistors with the gate made of conducting polymer, such as polyaniline shown here, can be used as sensors for gases and vapors. We have shown that the operating characteristics of the transistors as well as their selectivity for different gases can be tuned photochemically. The precisely dosed photons irradiating the PANI-emeraldine base and photo-oacid generator liberate protons that change the doping state of the PANI gate. This approach can be used for fabrication of miniature solid state sensing arrays.

